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Corrected Claims

1. A cartridge for use with an apparatus having a mounting head for making fluid comestibles under pressure comprising:
 - a supply of suitable flavor-containing materials for making the fluid comestible;
 - a cartridge inlet for forming a hermetic seal with the mounting head and introducing liquid under pressure from the mounting head into said cartridge;
 - a chamber connected to said cartridge inlet for containing said flavor-containing materials and for allowing the interaction of said flavor-containing materials with the liquid from said cartridge inlet under pressure therein to produce the fluid comestible;
 - a cartridge outlet connected to said chamber for discharging the fluid comestible produced in said chamber; and
 - a handle for facilitating the mounting of said cartridge to the mounting head, said handle comprising at least part of the wall of said chamber, said at least part of the wall of said chamber being sufficiently rigid and adapted for the user to hold without causing substantial deformation or damage during the mounting of said cartridge to the mounting head.
2. A cartridge as defined in claim 1 wherein said cartridge inlet, said chamber and said cartridge outlet are formed as one single, integral body.
3. A cartridge as defined in claim 2 wherein said cartridge inlet has a cross-section area significantly smaller than said chamber to reduce the force exerted by the pressure in said chamber to said hermetic seal.
4. A cartridge as defined in claim 1 wherein said cartridge outlet comprises an opening adapted to convert the fluid comestible produced in said chamber into a fluid jet having a sufficiently high speed and an arrangement to allow the fluid jet from said opening at said sufficiently high speed to interact with air, thereby generating crema for the fluid comestible.
5. A cartridge as defined in claim 4 wherein said arrangement is adapted to allow the fluid jet at said sufficiently high speed to inject into an amount of fluid comestible to generate the crema for the fluid comestible.
6. A method for using the cartridge as defined in claim 1 to make fluid comestibles comprising a step of holding said handle of said cartridge and mounting said cartridge to the mounting head; a step of causing the liquid to be delivered under pressure through the flavor-containing materials in said chamber and through said cartridge outlet and directly into a receptacle for consumption without contaminating the apparatus with the fluid comestibles, and a step of removing and disposing said cartridge, thereby simplifying the preparation of the fluid comestibles and relieving the user from the tedious cleaning work after preparing the fluid comestibles.

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7. A method for using the cartridge as defined in claim 1 to make fluid comestibles as defined in claim 6 wherein the pressure used to deliver the liquid is from an in-house plumb system.
8. A method for using the cartridge as defined in claim 1 to make fluid comestibles as defined in claim 6 wherein the pressure used to deliver the liquid is generated by one of a pump, pressurized steam and compressed air.
9. A method for using the cartridge as defined in claim 1 to make fluid comestibles as defined in claim 6 wherein the mounting head is hand-held.
10. A method for using the cartridge as defined in claim 1 to make fluid comestibles as defined in claim 6 wherein said step of holding said handle and mounting said cartridge to the mounting head comprises a step of causing an extension tube at the mounting head to be inserted into said cartridge inlet and a step of rotating said cartridge to lock said cartridge inlet to the mounting head under the guide of the extension tube.
11. A cartridge as defined in claim 2 wherein said chamber adapts one of a generally spherical shape, an oval shape and a cylindrical shape to improve the amount of pressure said cartridge can withstand.
12. A cartridge as defined in claim 11 further comprising a plurality of protrusions in at least one of the vertical ridge form, rib form and protruded dot form on the outer surface of said chamber to facilitate the connection and removal of said cartridge to and from the mounting head and to make the user feel cooler when holding said at least part of the wall of said chamber of said handle.
13. A cartridge as defined in claim 1 wherein said cartridge outlet is adapted to fit into the cartridge inlet of another said cartridge, thereby allowing a plurality of said cartridges to be connected to each other to facilitate the storage or packaging of said cartridges.
14. A cartridge as defined in claim 1 wherein said cartridge inlet comprises a first lock element for removably engaging with a second lock element on the mounting head to prevent said cartridge inlet from being separated from the mounting head by the liquid pressure in said chamber.
15. A cartridge as defined in claim 14 wherein said cartridge inlet further comprises a cylindrical opening dimensioned to receive a tubular extension on the mounting head for guiding the mounting of said cartridge inlet to the mounting head.
16. A cartridge as defined in claim 14 wherein said first lock element comprises a protruded member on said cartridge inlet for engaging with the second lock element which comprises at least one protrusion on the inner surface of a substantially cylindrical chamber of the mounting head, said protruded member on said cartridge inlet and the second lock element on the mounting head being so configured that rotation of said cartridge inlet causes it to move into or out of the substantially cylindrical chamber.
17. A cartridge as defined in claim 14 wherein said cartridge inlet comprises a safety element adapted to engage with a counterpart on the mounting head for preventing the removal of said cartridge from the mounting head when the pressure in said chamber is above a certain value.

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18. A cartridge as defined in claim 1 further comprising a filter for the flavor-containing materials in said chamber and a barrier film located below said filter and breakable by the fluid coming from said filter, said barrier being adapted to impede the transport of molecules including aroma and oxygen between said chamber and atmosphere.

19. A cartridge as defined in claim 18 wherein said cartridge inlet, said chamber, said cartridge outlet and said filter are made from substantially the same material to facilitate the recycle or reuse of the material thereby reducing the burden to environment.

20. A cartridge as defined in claim 2 wherein at least said cartridge inlet, said chamber, and said cartridge outlet is made from poly(lactic acid) based material, thereby making said cartridge biodegradable and reducing the burden to environment.

21. A cartridge as defined in claim 1 further comprising a water-permeable filter bag for enclosing at least one part of said supply of suitable flavor-containing materials in said chamber.

22. A cartridge as defined in claim 2 further comprising a filter for said flavor-containing materials and a plurality of protrusions on the inner wall of said chamber for supporting said filter during the interaction of said flavor-containing materials with the liquid under pressure and for leading the fluid comestibles from said filter to said cartridge outlet.

23. A cartridge as defined in claim 2 further comprising a barrier film for sealing said cartridge outlet, said barrier being adapted to impede the transport of molecules including aroma and oxygen between said chamber and atmosphere.

24. A cartridge as defined in claim 23 further comprising a second barrier film for sealing said cartridge inlet, said barrier film being adapted to impede the transport of molecules including aroma and oxygen between said chamber and atmosphere.

25. A cartridge as defined in claim 1 wherein said cartridge inlet comprises a substantially cylindrical opening and a barrier film adapted to impede the transport of molecules including aroma and oxygen between said chamber and atmosphere, said substantially cylindrical opening having a narrower section near said chamber to form a sealing bed for allowing said barrier film to be sealed the inside surface of said substantially cylindrical opening.

26. A cartridge as defined in claim 1 further comprising a removable cap for said cartridge inlet.

27. A cartridge as defined in claim 1 further comprising a valve located in said cartridge inlet for preventing the liquid in said chamber from gushing out of the cartridge inlet in case that the cartridge is separated from the mounting head when there is still pressure in the cartridge.

28. A cartridge as defined in claim 2 further comprising a piece of porous material comprising at least one of bonded fibers, unbonded fibers and foam above said flavor-containing materials for restricting the flavor-containing materials from moving out of said chamber.

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29. A cartridge as defined in claim 1 further comprising a valve in one of said cartridge inlet and cartridge outlet to stop the dripping of the residual fluid in the cartridge after the removal of the cartridge, said valve comprising an opening that is sufficiently small after the liquid pressure is removed.

30. A cartridge as defined in claim 1 further comprising a elastomer septum secured in said cartridge inlet, said elastomer septum being adapted to allow a needle having a fluid channel to penetrate and deliver the liquid under pressure to the flavor-containing materials in said chamber.

31. A cartridge as defined in claim 1 wherein said supply of flavor-containing materials comprises a predetermined amount of roasted ground coffee.

32. A cartridge as defined in claim 31 further comprising a predetermined amount of reactive material comprising calcium oxide for prolonging the freshness of said ground coffee and a porous hydrophobic film for preventing said ground coffee and the liquid from contacting said reactive material.

33. A cartridge as defined in claim 2 wherein said cartridge inlet, said chamber and said cartridge outlet are blow-molded as one single body.

34. A cartridge for use with an apparatus for making fluid comestibles under pressure with pressurized liquid comprising:

- a predetermined amount of a water-soluble flavor-containing materials, said water-soluble flavor-containing materials being mostly soluble in the pressurized liquid;

- a predetermined amount of an extractable flavor-containing materials, said extractable flavor-containing materials being mostly insoluble in the pressurized liquid but containing flavors extractable by the pressurized liquid;

- a chamber for containing said predetermined amounts of water-soluble and extractable flavor-containing materials and for allowing the interaction of the pressurized liquid with said water-soluble and extractable flavor-containing materials therein to produce the fluid comestible;

- a cartridge inlet for allowing the pressurized liquid to enter said chamber;

- a filter for said extractable flavor-containing materials and having numerous filter openings permeable to the pressurized liquid and sufficiently small to prevent said extractable flavor-containing materials from passing through, said filter being adapted to separate said water-soluble flavor-containing materials from said extractable flavor-containing materials, thereby restricting intermixing and potential interactions between said water-soluble and extractable flavor-containing materials;

- a cartridge outlet for the fluid comestible produced in said chamber; and

- a separator located below both said water-soluble and extractable flavor-containing materials in said chamber but above the lowest part of said cartridge outlet for keeping said flavor-containing materials above said separator, said separator having a plurality of separator openings adapted to be sufficiently large to prevent complete clogging of said separator by non-fluid materials including gel materials resulting from the interaction of said water-soluble flavor-containing materials with the pressurized liquid, thereby maintaining said separator

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sufficiently permeable to the fluid comestible during the process of making the fluid comestible from said cartridge.

35. A cartridge as defined in claim 34 wherein said water-soluble flavor-containing materials comprises at least one of milk solids, cocoa, creamer and any combination and wherein said extractable flavor-containing materials comprises one of coffee grounds, tea leaves and herb materials.

36. A cartridge as defined in claim 35 wherein said extractable flavor-containing materials is located above said water-soluble flavor-containing materials and separated from said water-soluble flavor-containing materials by said filter.

37. A cartridge as defined in claim 34 further comprising a first barrier film for sealing said cartridge inlet and a second barrier film located below said separator for sealing said cartridge outlet, said first and second barrier films being adapted to be breakable.

38. A cartridge as defined in claim 34 further comprising a second filter for said water-soluble flavor-containing materials.

39. A cartridge as defined in claim 34 wherein said separator openings have an approximate size of 0.1 mm to 2 mm to prevent the clogging of said separator by the non-fluid materials produced from said water-soluble materials.

40. A cartridge as defined in claim 34 wherein said cartridge outlet comprises an opening adapted to convert the fluid comestible produced in said chamber into a fluid jet having a sufficiently high speed and an arrangement to allow the fluid jet from said opening at said sufficiently high speed to interact with air, thereby generating crema for the fluid comestible.

41. A method for the preparation of fluid comestibles from a disposable cartridge comprising a cartridge inlet, a cartridge outlet, a handle, a chamber and one or more flavor-containing materials the chamber and a drink making machine having a mount head, which method comprising:

holding the handle to place the disposable cartridge to the mounting head;

aligning the cartridge inlet with a liquid outlet of the mounting head which is in communication with a pressurized water source;

locking the cartridge inlet to the mounting head to form and maintain a water-tight seal between the cartridge inlet and mounting head;

introducing the pressurized water from the liquid outlet into the chamber wherein the pressurized water interacts with the flavor-containing materials or particle materials to produce the fluid comestibles; and

discharging the fluid comestibles from the cartridge outlet of the disposable cartridge directly into a receptacle such a cup or carafe in such a way that the fluid comestibles produced does not contact or touch any part of the drink making machine, which makes the disposable cartridge the only part that is contacted or

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contaminated by the fluid comestibles, thereby relieving the user from the traditional, tedious cleaning work required after making fluid comestibles.

42. A method as defined in claim 41 wherein said aligning step comprises causing an extension tube, which has a lower part visible to the user and readily receivable in the cartridge inlet, on the mounting head to enter the cartridge inlet, thereby facilitating the locking step by providing guidance for the movement of the cartridge inlet relative to the mounting head.

43. A method as defined in claim 41 wherein said locking step comprises holding said handle to rotate the cartridge inlet relative to the mounting head until such rotation becomes tight enough.

44. A method as defined in claim 41 wherein said locking step comprise causing a needle having a fluid channel at the mounting head to penetrate a elastomer septum in the said cartridge inlet.

45. A method as defined in claim 41 wherein said locking step comprises pushing a latch or pin by a spring or other mechanism in the mounting head toward the cartridge inlet to engage with a fixture such as a notch or flange on the cartridge inlet.

46. A method as defined in claim 41 wherein the handle of the disposable cartridge comprises the side wall of the chamber, the side wall of the chamber being substantially rigid to function as a handle for the disposable cartridge.

47. A cartridge for use with an apparatus for making fluid comestibles with pressurized liquid under pressure comprising:

- a predetermined amount of suitable flavor-containing materials for the fluid comestible;
- a chamber for containing said flavor-containing materials and for allowing the interaction of the pressurized liquid with said flavor-containing materials therein to produce the fluid comestible;
- a cartridge inlet for the introduction of the pressurized liquid into said chamber;
- a cartridge outlet for the fluid comestible produced in said chamber;
- a collector located below said flavor-containing materials for collecting the fluid comestible produced in said chamber;
- a sufficiently small opening for converting the fluid comestible in said collector into a fluid jet at a sufficiently high speed;
- a filter located upstream of said sufficiently small opening for protecting said sufficiently small opening from being clogged by non-fluid materials including said flavor-containing materials; and
- an arrangement for the fluid jet at said sufficiently high speed to interact with air in such a way that very fine air bubbles are produced in the fluid comestible, thereby causing a visually appealing crema layer to be formed on top of the fluid comestible received in a receptacle.

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48. A cartridge as defined in claim 47 wherein said arrangement comprises a second small opening adapted to produce a second fluid jet to collide with the fluid jet produced from said sufficiently small opening, thereby generating crema for the fluid comestible.

49. A cartridge as defined in claim 47 wherein said arrangement is adapted to allow the fluid jet at said sufficiently high speed to collide with a surface of said cartridge outlet, thereby producing the crema layer for the fluid comestible.

50. A cartridge as defined in claim 47 wherein said cartridge outlet comprises an outlet chamber below said sufficiently small opening for receiving the fluid jet and maintaining an amount of the fluid comestible therein during the process of making the fluid comestible, wherein said arrangement allows fluid jet to inject into the fluid comestible in said outlet chamber to cause the mixing of air with the fluid comestible therein, thereby producing the crema for the fluid comestible, said outlet chamber having at least one opening for discharging the fluid comestible and crema .

51. A cartridge as defined in claim 47 wherein said arrangement is adapted to allow the fluid jet at said sufficiently high speed to inject directly into the receptacle, the fluid jet carrying the surrounding air into the fluid comestibles in the receptacle thereby generating said visually appealing layer of crema therein.

52. A cartridge as defined in claim 47 wherein said sufficiently small opening is normally substantially closed and is adapted to increase in size when the pressure above increases.

53. A coffee cartridge or package for the preparation of fluid comestible comprising:
a sealed chamber formed from substantially air- and water- impermeable materials for containing an amount of roasted coffee;

a freshness promoter located in said sealed chamber for prolonging the freshness of the roasted coffee therein, said freshness promoter comprising a supply of reactive materials that can react with the carbon dioxide released by the roasted coffee in said sealed chamber, thereby preventing over pressurization of said package as a result of the release of carbon dioxide, and react with water vapor in said sealed chamber, thereby impeding the deterioration of the roasted coffee; and

a separator for preventing said freshness promoter from contaminating the roasted coffee, said separator being permeable to carbon dioxide and water vapor to allow them to pass through readily and react with said freshness promoter.

54. A package as defined in claim 53 wherein said supply of reactive materials comprises at least one of lime, alkali metal oxide and alkaline earth metal oxide.

55. A package as defined in claim 53 wherein said separator is formed from a hydrophobic porous film adapted to allow gas to pass through but prevent liquid water from passing through to reach said reactive materials.

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56. A package as defined in claim 53 further comprising a supply of roasted coffee, an inlet for introducing pressurized liquid into said sealed chamber to extract said roasted coffee to form the fluid comestible, and an outlet for the fluid comestible.

57. A package as defined in claim 53 further comprising a supply of roasted coffee sealed in said chamber shortly after roasting to preserve the aroma of the freshly roasted beans.

58. A cartridge connector for use in preparing fluid comestibles from a cartridge comprising a flavor-containing materials in a chamber and a cartridge inlet having a substantially cylindrical body, a through-opening in the substantially cylindrical body connected to the chamber and a lock element, which cartridge connector comprising:

a substantially cylindrical chamber for receiving the substantially cylindrical body of the cartridge inlet;
a channel for providing communication between a source of pressurized liquid and the through-opening in the substantially cylindrical body after the substantially cylindrical body is received in said substantially cylindrical chamber;

a second lock element for removably engaging with the lock element on the cartridge inlet to prevent the substantially cylindrical body of the cartridge inlet from being pushed out of said substantially cylindrical chamber by the pressure of the pressurized liquid, whereby, in use, the substantially cylindrical body of the cartridge inlet is received in said substantially cylindrical chamber to form a hermetic seal, which is maintained by said second lock element and the lock element on the cartridge inlet, and the pressurized liquid is delivered through said channel and the through-opening to the flavor-containing materials in the cartridge wherein the pressurized liquid and materials interacts to form the fluid comestibles.

59. A cartridge connector as defined in claim 58 further comprising a valve for controlling the liquid flow in said channel, said valve being adapted to open said channel when the substantially cylindrical body of the cartridge inlet is received in said substantially cylindrical chamber and to close said channel when the substantially cylindrical body of the cartridge is removed from said substantially cylindrical chamber.

60. A cartridge connector as defined in claim 58 further comprising a tubular extension connected to said channel, said tubular extension being adapted to fit into the through-opening of the cartridge inlet to form the hermetic seal when the lock element of the cartridge inlet is engaged with said second lock element.

61. A cartridge connector as defined in claim 58 further comprising a cylindrical member extended substantially out of said substantially cylindrical chamber to function as a guide for the user to insert the substantially cylindrical body of the cartridge inlet into said substantially cylindrical chamber.

62. A cartridge connector as defined in claim 58 wherein said second lock element comprises a raised section on the inner surface of said substantially cylindrical chamber adapted to engage with the lock element of the cartridge inlet so that the rotation of the cartridge inlet in said substantially cylindrical chamber causes said cartridge inlet to move into or out of said cylindrical chamber.

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63. A cartridge connector as defined in claim 58 further comprising a safety element for preventing the removal of the cartridge from said cartridge connector when the pressure in said cartridge is high.

64. A cartridge connector as defined in claim 58 wherein said second lock element comprises a thread on the inner surface of said substantially cylindrical body of the cartridge connector for engaging with a thread on the outer surface of the substantially cylindrical body of the cartridge.

65. A cartridge connector as defined in claim 58 wherein said second lock element comprises a lock chamber in the wall of said substantially cylindrical chamber, a rigid member receivable in said lock chamber for engaging with the first lock element that has a flange for the substantially cylindrical body, and a spring for activating said rigid member to engage with the flange.

66. A cartridge for use with a holder having an open upper end and a large opening at its bottom in an apparatus to make beverage, said cartridge comprising:

a chamber adapted to be received in the holder, said chamber having a generally open upper end and a generally closed lower end;

a flange formed at said generally open upper end of said chamber, said flange being adapted to be supported by the holder to form a seal with the brew head of the apparatus;

a filter sealed at its peripheral to said flange and conformed partially to said chamber to form a cavity above said filter and a fluid collection space between said filter and said generally closed lower end of said chamber

suitable flavor-containing materials in said cavity formed by said filter;

a cover sealed to said flange for maintaining said flavor-containing materials in said cavity; and

a cartridge outlet formed at said generally closed lower end of said chamber for discharging the drink, said cartridge outlet being adapted to discharge the beverage directly into a receptacle such as a cup or carafe without contacting or contaminating the holder, thereby relieving the user from the tedious work of cleaning the holder and apparatus after preparing beverages.

67. ~~{canceled}~~ A cartridge connector as defined in claim 66 further comprising a barrier film for sealing the cartridge outlet and preventing the loss of aroma or freshness of the flavor-containing materials, said barrier film being breakable by liquid pressure.

68. A cartridge for use with an apparatus having a mounting head for making fluid comestibles with pressurized liquid under pressure comprising:

a supply of a flavor-containing materials;

a chamber for containing said flavor-containing materials for allowing the interaction of said materials with liquid under pressure therein to produce the fluid comestible;

a cartridge outlet for the fluid comestible; and

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a cartridge inlet having an opening and a elastomer septum secured to said opening to seal said cartridge inlet, said elastomer septum being adapted to be penetrated by a rigid, elongated thin member on the mounting head for introducing pressurized liquid from the mounting head to said flavor-containing materials in said chamber wherein the pressurized liquid interacts with said flavor-containing materials to produce the drink and to apply sufficient force to said rigid elongated thin member to prevent said thin member from being pushed out by the pressure in said chamber.

69. A cartridge as defined in claim 68 wherein said septum comprises a normally closed opening for facilitating the penetration of said thin member through said septum.

70. A cartridge for use with an apparatus having a mounting head for making fluid comestibles with pressurized liquid under pressure comprising:

a predetermined amount of a suitable flavor-containing materials;

a rigid chamber for containing said flavor-containing materials for allowing the interaction of said materials with liquid under pressure therein to produce the fluid comestible, said rigid chamber being adapted to function as a handle for a user to hold to mount the cartridge to the mounting head without substantially deforming said rigid chamber;

a cartridge outlet connected to said rigid chamber for discharging the fluid comestible; and

a cartridge inlet for forming a hermetic seal with the mounting head of the apparatus and for introducing pressurized liquid from the mounting head to said flavor-containing materials in said rigid chamber, said cartridge inlet being adapted to have a cross-section area significantly smaller than said rigid chamber for facilitating the formation of said hermetic seal and reducing the force exerted by the pressurized liquid to said hermetic seal, thereby preventing leakage and breaking of said hermetic seal.

71. A cartridge as defined in claim 70 wherein said rigid chamber comprises a side wall adapted to function as the handle for the user to hold, said side wall having protrusions comprising at least one of ribs, ridges and dots on the outer surface of said side wall to reduce heat conduction rate from the pressurized liquid inside said cartridge to the user's hand, thereby preventing the user from being burned by heat when the user holds said rigid chamber to remove said cartridge from the apparatus.

72. A cartridge for use with an apparatus having a mounting head for making fluid comestibles with pressurized liquid under pressure comprising:

a supply of a suitable flavor-containing materials for the production of fluid comestible;

a filter for said flavor-containing materials;

a lower rigid chamber comprising a bottom end, a top end, and a cartridge outlet formed at said bottom end for discharging the beverage produced from said flavor-containing materials; and

an upper rigid chamber comprising a top end, a bottom end connected to said top end of said lower rigid chamber, and a cartridge inlet formed at said top end of said upper rigid chamber for forming a hermetic seal

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with the mounting head and to introduce pressurized liquid from the mounting head into said upper rigid chamber, said cartridge inlet having a sufficiently small cross-section area to lower the force exerted by the pressurized liquid to said cartridge inlet thereby improving said hermetic seal and preventing leakage and breaking of said hermetic seal, whereby, in use, said cartridge inlet is engaged with the mounting head to form said hermetic seal to allow the pressurized liquid to be introduced into said rigid chambers wherein it interacts with the flavor-containing materials to form beverage.

73. A cartridge as defined in claim 72 wherein said lower and upper rigid chambers are formed from sheet material such as polyester, polypropylene or aluminum sheet by at least one of mechanical forming, thermoforming and a combination of mechanical forming and thermoforming.

74. A cartridge as defined in claim 72 further comprising a second flavor-containing materials and a second filter for said second materials, said second flavor-containing materials being maintained above said second filter and below said filter and said supply of a suitable flavor-containing materials.

75. A cartridge as defined in claim 72 wherein said lower and upper rigid chambers are produced by blow molding.

76. A cartridge as defined in claim 72 further comprising a water-soluble materials and a second filter attached to said bottom end of said lower rigid chamber for maintaining said water-soluble materials above said cartridge outlet, said second filter having sufficiently large openings to prevent clogging of said second filter by gels formed from said water-soluble materials during the beverage making process.

77. A cartridge as defined in claim 72 wherein said cartridge outlet comprises an opening adapted to transform the beverage produced in said chambers into a fluid jet having a sufficiently high speed and an arrangement to allow the fluid jet to interact with air to cause formation of a visually appealing crema layer for the fluid comestible.

78. A cartridge as defined in claim 77 wherein said arrangement is adapted to allow the fluid jet at said sufficiently high-speed to inject into an amount of fluid comestible to cause the mixing of air and the fluid comestible to form said crema layer.